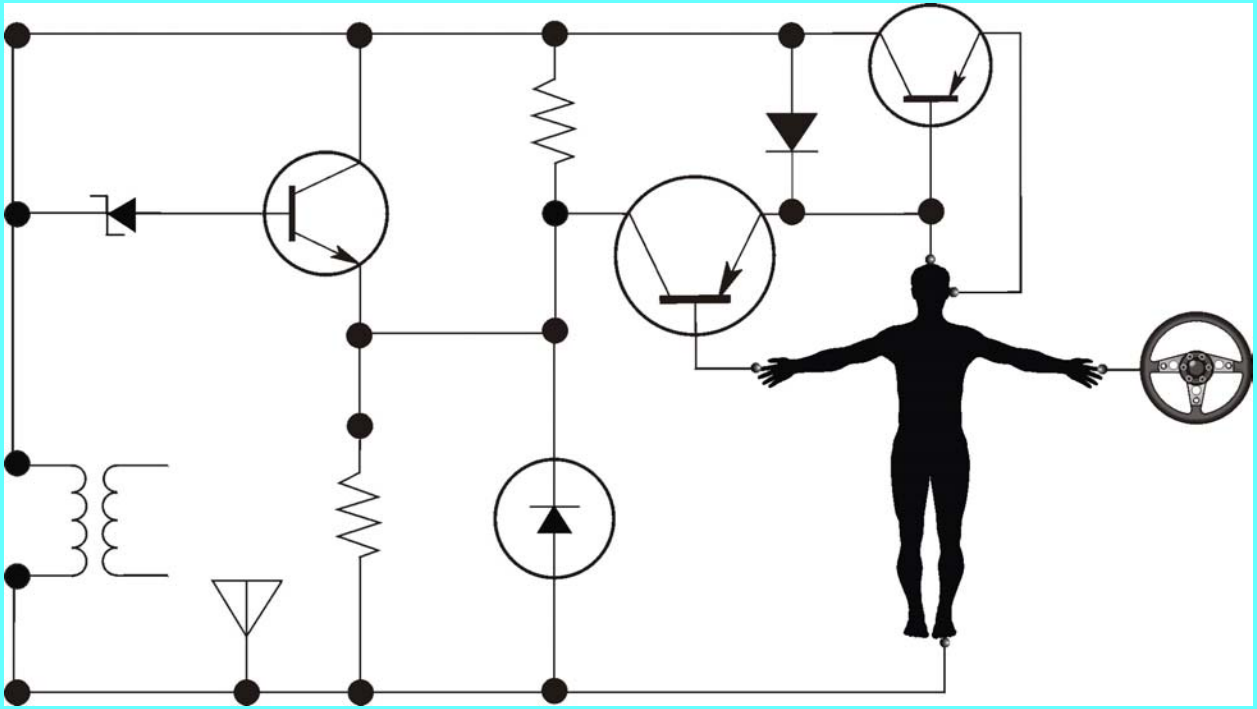
INTELLIGENT VEHICLE INITIATIVE

IVI Human Factors



Michael Perel
National Highway Traffic Safety Administration
IVI Human Factors Team Leader
ITS America Annual Meeting, April 2002

IVI HF Team Organization

- Michael Perel, Team Leader (NHTSA)
- Thomas Granda (FHWA)
- Robert Caroll (FMCSA)
- Michael Goodman (NHTSA)
- Robert Adduci (Volpe/FTA)
- James Foley, support staff (Mitretek/JPO)

Intelligent Vehicle Initiative

IVI's Mission:

Prevention of Highway Crashes and the Fatalities and Injuries They Cause

IVI's Focus is to prevent crashes by helping drivers avoid hazardous mistakes. Past USDOT safety programs have focused on crash mitigation.

Prevention: A New Direction for USDOT Safety Programs

The objectives of IVI activities are to:

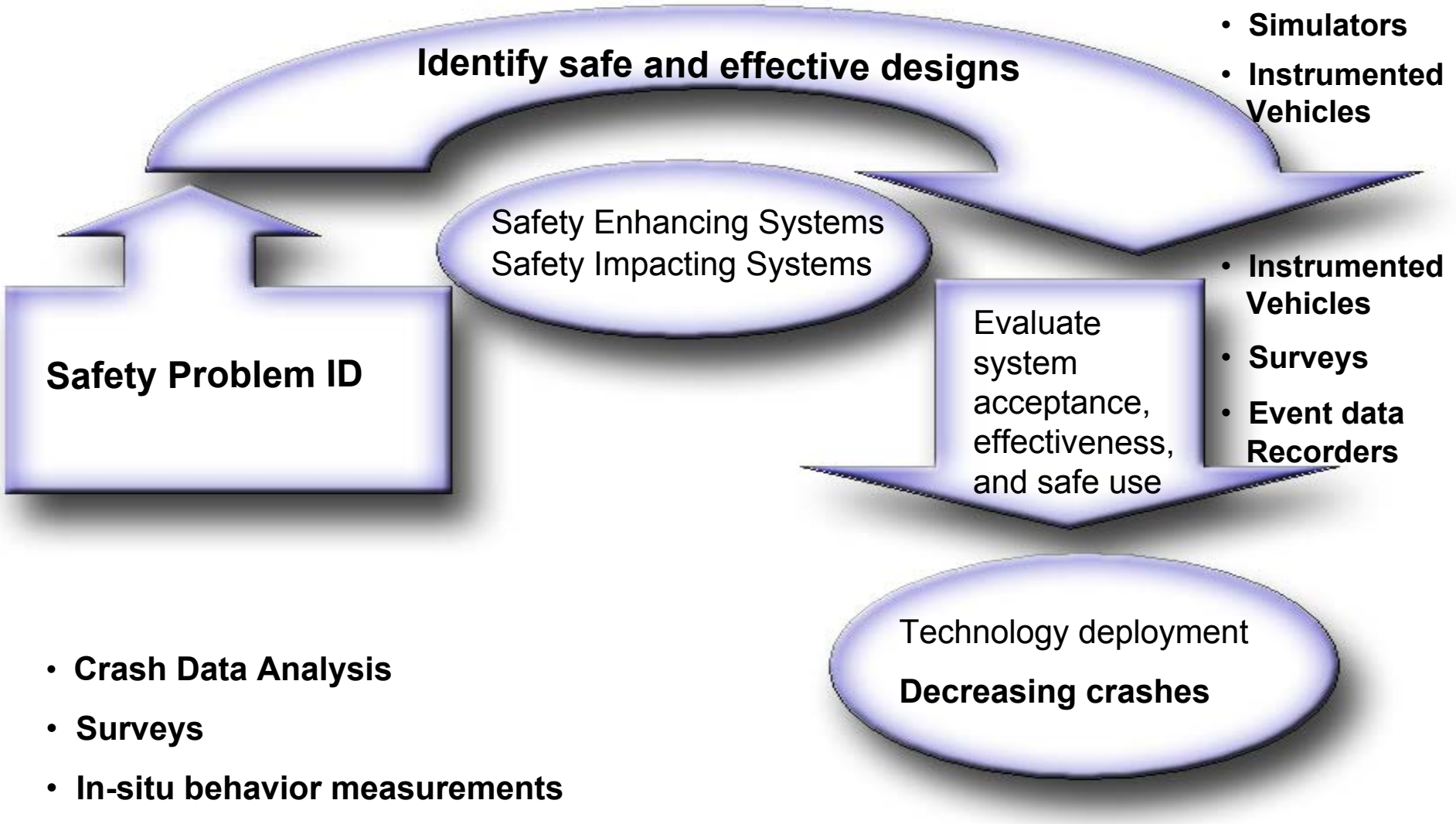
- Minimize safety problems associated with driver distraction
- Facilitate accelerated development and deployment of crash avoidance systems

However while Technology offers new safety solutions, it also poses new problems.

Team Roles

- Provide expert advice on human factors issues
- Help disseminate research results
- Coordinate human factors information & programs among different platforms
- Identify and implement IVI human factors research projects through Platform Directors

Integration of Human Factors Research in IVI Process



Human Factors Issues for Collision Avoidance Systems

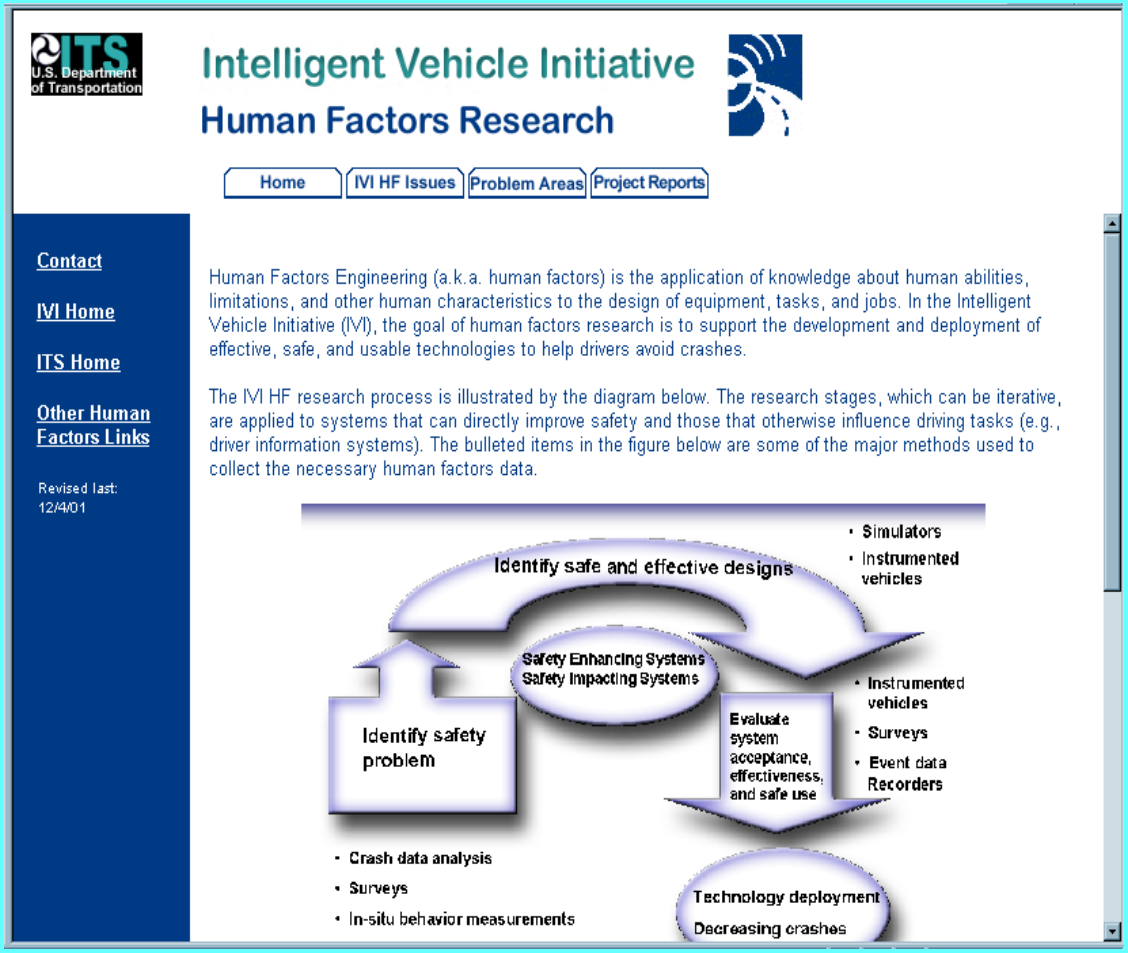
- **Warning interface characteristics that**
  - attract driver attention and
  - enhance response to imminent crash
- **Timing of warning compatibility with driver's reaction time**
- **Effects of false/nuisance alarms on driver performance and acceptance**

Human Factors Evaluation Factors

- Appropriateness of driver response to system alerts
- Physical ergonomics of the DVI
- Driver behavior changes (learning, adaptation, errors, workload, etc)
- Usability/acceptability

Research Dissemination

www.its.dot.gov/ivi/ivihf/index.html



HF IVI Research Coordination

Safety Impacting Issues

- Driver Distraction
- Equipment/Information Integration
- Naturalistic driver behavior data collection

HF IVI Research Coordination

Cross Platform

- Ongoing Transit Integration of FCW & SCW
- Proposed Project on (Light Vehicle) Collision Warnings Integration

What's New?

Completed

- Simulator-based study of the timing of forward collision warnings and the avoidance of rear end crashes by distracted and non-distracted drivers; and
  how warning tone urgency affects driver response

What's New?

Completed

- **On-road study of Far Infra Red Night Vision Systems.**
  Final Report under review.
  - TRB 2002: DRIVER BEHAVIOR AND PERFORMANCE USING AN INFRARED NIGHT VISION ENHANCEMENT SYSTEM
- **The Effect of False Forward Collision Warnings on Driver Responses**
  Final Report under review.

Driver Distraction Research

Completed

- **Inventory of In-Vehicle Technology Human Factors Design Characteristics**
  Final Report under review.

What's New?

- **Naturalistic Driving Data study – Instrumentation of vehicle nearly completed**
- **CAMP Driver Workload Metrics Study - Criterion to Determine when the Driver is Overloaded**
- **Measure of Truck Driver Workload**
  - Unique from light vehicles

Key HF Research Challenges

- Understanding and measuring behavioral adaptation
- Understanding impact of cognitive tasks & workload
- Predicting safety impact from surrogate measures of driver performance

Key HF Research Challenges

- How device operation influences driver ability to understand & respond to warnings
  - Warning frequency, false warning, and missed signals
- How to design for variability in driver capabilities and behaviors